

CLAIMS

1. A method comprising:  
storing a set of resource equivalencies in memory;  
5 selecting at least one resource equivalency from the set of resource  
equivalencies;  
selecting at least one resource from the selected resource equivalency;  
using the selected at least one resource as required by an autonomic  
computing system.  
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2. The method of claim 1, wherein the set of resource equivalencies comprises  
a resource equivalency representing a plurality of physically distinct resources that  
are logically equivalent.

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3. A method comprising:
- specifying a type of resource class for an autonomic computing system;
  - creating at least one grouping of resources of the specified type of resource class;
  - 5 creating a filter from a set of attributes that define a required functional attribute of a type of resource;
  - removing from the at least one grouping of resources any resource that does not match the filter; and
  - defining a set of resources remaining in the at least one grouping as an
  - 10 equivalency.
4. The method of claim 3, wherein the specifying a type of resource class comprises harvesting implicit relationships among resources via self-discovery.
- 15 5. The method of claim 4, further comprising:
- discovering an additional resource;
  - matching attributes of the additional resource to the filter; and
  - including the additional resource in the set of resources remaining in the at least one grouping as an equivalency.

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6. The method of claim 4, further comprising:  
discovering a resource deletion from an autonomic computing system;  
determining whether the resource deletion is represented in the set of  
resources remaining in the at least one grouping as an equivalency; and  
5 if represented in the equivalency, removing the resource from the  
equivalency.

7. The method of claim 3, further comprising:  
nesting two or more sets of equivalent resources within an equivalency.

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8. A computer readable medium comprising computer instructions for performing the following:

storing a set of resource equivalencies in memory;

selecting at least one resource equivalency from the set of resource

5 equivalencies;

selecting at least one resource from the selected resource equivalency;

using the selected at least one resource as required by an autonomic computing system.

10 9. The computer readable medium of claim 8, wherein the set of resource equivalencies comprises a resource equivalency representing a plurality of physically distinct resources that are logically equivalent.

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10. A computer readable medium comprising computer instructions for performing the following:

specifying a type of resource class for an autonomic computing system;

creating at least one grouping of resources of the specified type of resource

5 class;

creating a filter from a set of attributes that define a required functional attribute of a type of resource;

removing from the at least one grouping of resources any resource that does not match the filter; and

10 defining a set of resources remaining in the at least one grouping as an equivalency.

11. The computer readable medium of claim 10, wherein the specifying a type of resource class comprises harvesting implicit relationships among resources via  
15 autonomic computing system self-discovery.

12. The computer readable medium of claim 11, further comprising computer instructions for performing the following:

discovering an additional resource in the autonomic computing system;

matching attributes of the additional resource to the filter; and

5 including the additional resource in the set of resources remaining in the at least one grouping as an equivalency.

13. The computer readable medium of claim 11, further comprising computer instructions for performing the following:

10 discovering a resource deletion from an autonomic computing system;

determining whether the resource deletion is represented in the set of resources remaining in the at least one grouping as an equivalency; and

if represented in the equivalency, removing the resource from the equivalency.

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14. The computer readable medium of claim 10, further comprising computer instructions for performing the following:

nesting two or more sets of equivalent resources within an equivalency.

15. An autonomic computing system resource manager, comprising:

memory;

a resource monitor, communicatively coupled with each resource in an

5 autonomic computing system, and with the memory, for monitoring, and exchanging data with, each resource in the autonomic computing system;

an equivalency definer, communicatively coupled with each resource in the autonomic computing system, and with the memory, for defining at least one

equivalency representing at least one set of equivalent resources in the autonomic

10 computing system, and storing the at least one equivalency in the memory;

a policy generator, communicatively coupled with the memory, for providing in the memory a representation of a system-wide graph of available actions corresponding with each resource in the autonomic computing system; and

an automation engine, communicatively coupled with the resource monitor,

15 with each resource in the autonomic computing system, and with the memory, for providing available actions to at least one available resource in the autonomic computing system, the at least one available resource being selected from at least one available resource represented in the at least one equivalency in order for the autonomic computing system to establish and maintain a desired end state.

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16. The autonomic computing system resource manager of claim 15, further comprising:

5 a resource harvester, communicatively coupled with each resource in the autonomic computing system, with the resource monitor, with the equivalency definer, with the policy generator, and with the memory, for specifying implicit relationships between resources in the autonomic computing system via self discovery;

10 17. The autonomic computing system resource manager of claim 15, wherein:  
the policy generator further for specifying implicit relationships between resources in the autonomic computing system.

15 18. The autonomic computing system resource manager of claim 15, wherein:  
the equivalency definer for defining at least one equivalency representing at least two sets of equivalent resources nested within at least one set of equivalent resources.



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19. The autonomic computing system resource manager of claim 15, wherein:  
the equivalency definer for defining at least one equivalency representing a plurality of physically distinct resources that are logically equivalent in the autonomic computing system.

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20. The autonomic computing system resource manager of claim 15, wherein the equivalency definer defines each of the at least one equivalency representing at least one set of equivalent resources in the autonomic computing system by:

- specifying a type of resource class for the autonomic computing system;
- 10 creating at least one grouping of resources of the specified type of resource class;
- creating a filter from a set of attributes that define a required functional attribute of a type of resource;
- removing from the at least one grouping of resources any resource that does
- 15 not match the filter; and
- defining a set of resources remaining in the at least one grouping as an equivalency.

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21. The autonomic computing system resource manager of claim 15, wherein the at least one set of equivalent resources comprises at least one network interface card all being logically equivalent in the autonomic computing system; and wherein the automation engine provides available actions to at least one network
- 5 interface card in the autonomic computing system, the at least one network interface card being selected from at least one available network interface card represented in at least one equivalency in order for the autonomic computing system to establish and maintain a desired end state.

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22. An autonomic computing system, comprising:

distributed resources comprising at least one set of equivalent resources; and

an autonomic computing system resource manager, communicatively

coupled with the at least one set of equivalent resources, the autonomic computing

5 system resource manager comprising:

memory;

a resource monitor, communicatively coupled with each resource in

the at least one set of equivalent resources, the resource harvester, and the

memory, for monitoring, and communicating data with, each resource in the at least

10 one set of equivalent resources;

an equivalency definer, communicatively coupled with each resource

in the at least one set of equivalent resources, with the resource harvester, and with

the memory, for defining at least one equivalency representing the at least one set

of equivalent resources, and storing the at least one equivalency in the memory;

15 a policy generator, communicatively coupled with the memory and with

the resource harvester, for providing in the memory a representation of a system-

wide graph of available actions corresponding with each resource in the at least one

set of equivalent resources; and

an automation engine, communicatively coupled with the resource

20 monitor, with each resource in the at least one set of equivalent resources, and with

the memory, for providing available actions to at least one resource in the at least

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one set of equivalent resources, the at least one resource being selected from at least one available resource represented in the at least one equivalency in order for the autonomic computing system to establish and maintain a desired end state.

- 5    23.    The autonomic computing system of claim 22, further comprising:  
         a resource harvester, communicatively coupled with each resource in the at least one set of equivalent resources, with the resource monitor, with the equivalency definer, with the policy generator, and with the memory, for specifying implicit relationships between resources in the autonomic computing system via self  
10    discovery.

24.    The autonomic computing system of claim 22, wherein the at least one set of equivalent resources comprises a plurality of physically distinct resources that are logically equivalent in the autonomic computing system.

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25. The autonomic computing system of claim 22, wherein the equivalency definer defines each of the at least one equivalency representing at least one set of equivalent resources in the autonomic computing system by:

- specifying a type of resource class for the autonomic computing system;
- 5 creating at least one grouping of resources of the specified type of resource class;
- creating a filter from a set of attributes that define a required functional attribute of a type of resource;
- removing from the at least one grouping of resources any resource that does
- 10 not match the filter; and
- defining a set of resources remaining in the at least one grouping as an equivalency.